

Exemption No. 6953

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

The Boeing Company
for an exemption from § 25.1435(b)(1) of
Title 14, Code of Federal Aviation Regulations

Regulatory Docket No. 29620

GRANT OF EXEMPTION

By letter of June 14, 1999, Mr. Norman I. Lee, III, Manager, Certification, Certification Programs, B-H320. The Boeing Company, PO Box 3707, Seattle, WA, 98124-2207, petitioned for an exemption from the static pressure test requirement of § 25.1435(b)(1) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit compliance by similarity to the Boeing 737-700 hydraulic system and by an engineering design review of the added straight-line hydraulic tube installations of the Boeing Model 737-900 airplane.

The petitioner requests relief from the following regulation:

Section 25.1435(b)(1) states that a complete hydraulic system must be static tested to show that it can withstand 1.5 times the design operating pressure without a deformation of any part of the system that would prevent it from performing its intended function. Clearance between structural members and hydraulic system elements must be adequate, and there must be no permanent detrimental deformation. For the purpose of this test, the pressure relief valve may be made inoperable to permit application of the required pressure.

The petitioner's supportive information is as follows:

"In lieu of a static test, Boeing proposes to demonstrate compliance with FAR [Federal Aviation Regulations] § 25.1435(b)(1) by similarity to the 737-700 hydraulic system and by engineering design review of the added straight-line hydraulic tube installations. The 737-900 adds to the overall length of the 737-700 approximately 334 inches (27 feet 10 inches), 180 inches forward of the wing and 154 inches aft of the wing. Except for the straight-line hydraulic tube additions required due to the lengthened fuselage, the 737-900 hydraulic distribution system is identical to the 737-700. The 737-700 has previously showed compliance with FAR 25.1435(b)(1) during the certification of that aircraft.

"The applicant presents the following to substantiate that this Petition for Exemption provides for an equivalent level of safety as well as eliminates inefficiencies and added cost.

"1) The purpose of the test required by FAR 25.1435(b)(1) is to check a complete hydraulic system and show adequate separation between the hydraulic and adjacent system elements. (Adjacent system elements include structure, electrical wiring, environmental system ducts, and other hydraulic components.) The test is to demonstrate that there will be no permanent detrimental deformation that would prevent the hydraulic system from performing its intended function. Since the 737-900 hydraulic system is identical to the 737-700 except for the straight-line tubing additions, tubing/hose deformation and clearance to adjacent elements have previously been verified on the 737-700.

"2) To show compliance with FAR 25.1435(b)(1), a 737-700 (YA004) was pressure tested to 3,400 psig (system pressure relief limit). The tests conducted verified that proper separation exists between hydraulic and adjacent system elements. This pressure was in agreement with Notice of Proposed Rule Making (NPRM) 96-6 (issued July 3, 1996), FAA Exemption No. 6086, and JAR 25.1435 (b)(1) per JAA CRI D-02. The aforementioned NPRM states:

'The complete hydraulic system(s) must be functionally tested on the airplane in normal operation over the range of motion of all associated user systems. The test must be conducted at the system relief pressure [or] 1.25 times DOP if a system pressure relief device is not part of the system design. Clearances between hydraulic system elements and other systems or structural elements must remain adequate and there must be no detrimental effects.'

"3) The added straight-line tubing will be installed per Boeing standard design requirements. An engineering review of the final assembly will assure that the guidelines have been met and therefore the installation is in compliance with FAR 25.1435(b)(1).

"Conclusion:

"The proposed exemption requests that the 737-900 hydraulic system be allowed to show compliance to FAR 25.1435 (b)(1) by similarity to the tests conducted on the 737-700 and by engineering design review of the final installation. This request is based on the fact that the 737-900 hydraulic system is identical to the 737-700 hydraulic system except for the straight-line tubing added to account for the lengthened fuselage body.

"In view of the substantiating factors given above, Boeing asserts that the method of proposed compliance provides, in the public interest, assurance of safe operation and hereby petitions the FAA to grant the subject exemption."

A summary of the petition was published in the Federal Register on July 12, 1999 (64-FR-37580). No comments were received.

The Federal Aviation Administration's analysis/summary is as follows:

The FAA has carefully considered the information provided by the petitioner, and has determined that there is sufficient merit to warrant a grant of exemption.

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR 11.53), The Boeing Company is hereby granted an exemption from § 25.1435(b)(1) of 14 CFR to the extent necessary to permit type certification of the Model 737-900 by showing compliance by similarity to the Boeing 737-700 hydraulic system and by an engineering design review of the added straight-line hydraulic tube installations of the Model 737-900 airplane. All test results pertinent to this exemption must be documented in a report and a copy provided to this office.

Issued in Renton, Washington, on August 20, 1999.

/s/ Vi L. Lipski
Vi L. Lipski
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100